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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,582	03/31/2001	Alexander V. Reshetov	42390P8654	6822

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EXAMINER

NGUYEN, KIMBINH T

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/823,582	Applicant(s) RESHETOV ET AL.	
	Examiner Kimbinh T. Nguyen	Art Unit 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 67-99 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 67-99 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is responsive to amendment filed 04/13/05.
2. Claims 67-99 are pending in the application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 67-75, 77-81, 83-90, 95 and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perry, U.S. Patent No. 6,483,518, in view of Pfister et al. (6,498,607).

Claim 67, Perry discloses a machine-readable data structure stored on a machine-readable medium (col. 8, lines 33-35) comprising appearance data (col. 10, line 31) for a plurality of nodes (col. 19, line 9) associated with a portion of a surface of an object (col. 8, lines 11-12), displacement data that indicates displacement distances for the nodes (col. 8, lines 13-14 and Figure 1, num. 106) from corresponding reference nodes (Figure 1, num. 107) and local coordinate system data (col. 8, line 2), where the 3 types of data are on one data structure (col. 8, lines 2-8). Pfister et al. discloses a local coordinate system data that indicates a local coordinate system for the nodes (integer grid positions (nodes) that define the bounds on the locations of surfel object as a local coordinate system; col. 5, lines 37-44; col. 12, lines 26-39). It would have been obvious to one of ordinary skill in the art at the time the invention was made to

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incorporate the local coordinate system for the nodes taught by Pfister into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because using the surfel grid that defines at the resolution of an image plane or a display screen, it would provide efficiently render the surfel objects (col. 5, lines 52-53).

Claims 68 and 69, Perry et al. discloses the displacement distances for the nodes that are arranged in a grid (sample locations lie on a regular grid; col. 2, lines 25-30); the displacement distances for the nodes that are in a base plane in the local coordinate system (col. 8, lines 13-15).

Claim 70, Perry discloses where the coordinate system data indicates a base plane (Perry, col. 7, line 67 and Figure 1) and where the displacement data indicates a displacement distance from a corresponding reference in the plane (Perry, col. 8, lines 13-15).

Claim 71, Perry the local coordinate system data comprises data coordinates for the reference nodes (hierarchical distance field: surface nodes), the reference nodes are regularly spaced and are arranged in a grid (col. 10, lines 5-11).

Claim 72, Perry discloses where the coordinate system data comprises an origin, first axis, second axis (Perry, col. 7, line 67) and length associated with the first axis (Perry, Figure 1).

Claim 73, Perry allows the user the option to select any number of nodes (i.e., in order to provide efficiency for recursive procedures in that there is a central node for

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each division see Perry, col. 19, line 10, which allows any number of nodes to be selected and col. 15, lines 1-2, for recursive subdivision of cells).

Claim 74, Perry discloses appearance and displacement data with an independent value for each of the nodes (Perry, col. 10, lines 28-33).

Claim 75, Perry discloses more rendering calculations (col. 20, line 16 through col. 21, line 13).

Claim 77, Perry discloses accessing graphical data for a plurality of nodes Perry, col. 19, line 9) that represent a portion of a surface of a three-dimensional object Perry, col. 8, lines 1 1-12). The remarks presented above with respect to claims 67 and 75 apply equally to the remainder of this claim.

Claim 78, the remarks presented above with respect to claims 68 and 71 apply equally to this claim.

Claim 79, Perry discloses the local coordinate system data includes accessing data sufficient to define a base plane (col. 14, lines 61-62); and more rendering calculations include determining displaced nodes by combining displacement distances with corresponding reference nodes in the base plane (combination of the sampled distance value, the combined cell; col. 14, line 61 through col. 15, line 2).

Claim 80, the remarks presented above with respect to claim 73 apply equally to this claim.

Claim 81, Perry discloses determining four pixels of a quadrilateral that correspond to four nodes from the plurality of nodes, determining an inner pixel contained within the

quadrilateral (Perry, Figure 25) and interpolating a value for the inner pixel by using neighboring vertices (Perry, col. 19, line 39 to col. 20, line 4).

Claim 83, Perry discloses determining four pixels of a quadrilateral that correspond to four nodes from the plurality of nodes, determining an inner pixel contained within the quadrilateral (Perry, Figure 25) and interpolating a value for the inner pixel by using neighboring vertices (Perry, col. 19, line 39 to col. 20, line 4).

Claim 84, Perry discloses accessing graphical data for a plurality of nodes Perry, col. 19, line 9) that represent a portion of a surface of a three-dimensional object Perry, col. 8, lines 1 1-12). The remarks presented above with respect to claim 67 apply equally to the remainder of this claim.

Claim 85, Perry discloses accessing graphical data for a plurality of nodes Perry, col. 19, line 9) that represent a portion of a surface of a three-dimensional object Perry, col. 8, lines 1 1-12). The remarks presented above with respect to claims 67 and 75 apply equally to the remainder of this claim.

Claim 86, the remarks presented above with respect to claim 79 apply equally to this claim.

Claim 87, Perry discloses a graphics adapter (converting the edited HDF to standard form; col. 22, lines 24-33); a rendering unit to render graphical adapter (a rendering engine 2170; col. 21, line 14); logic of the rendering unit to render graphical data (col. 21, lines 14-16). The remarks presented above with respect to claim 67 apply equally to the remainder of this claim.

Claim 88, Perry discloses the rendering unit comprising logic to determine displaced nodes by combining indicated displacement distances with nodes indicated in the graphical data (combination of the sampled distance values and the cell's surface representation error; col. 14, lines 63-64) which are regularly space and arranged in a grid (a sparse fixed grid wavelet structure quadtree or octree; col. 10, lines 5-11).

Claim 89, the remarks presented above with respect to claim 69 apply equally to this claim.

Claim 90, the remarks presented above with respect to claim 72 apply equally to this claim.

Claims 95 and 96, the remarks presented above with respect to claims 88 and 90 apply equally to this claim.

5. Claims 76 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perry, U.S. Patent No. 6,483,518, in view of Pfister et al. (6,498,607) and further in view of Cox et al. (5,751,931).

Claim 76, Cox et al. discloses sending the data structure over the Internet (col. 5, line 40 through col. 6, line 40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Internet taught by Cox into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because it would implement to display time-series data for a global net-work (col. 5, lines 41-42).

Claim 82, Perry in view of Pfister does not teach disclose removing a node if it lies outside a view volume represented by a clipping function. However, Cox discloses a clipping surface, which obscures nodes that do not meet a threshold value (col. 2, lines 53-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate removing a node if it lies outside a view taught by Cox into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because it would allow users interactively manipulate the clipping surface (col. 2, lines 57-60).

6. Claims 91, 92, 98, 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perry, U.S. Patent No. 6,483,518, in view of Pfister et al. (6,498,607) and further in view of Bodin et al. (6,760,784).

Claims 91, 92, 98 and 99, Bodin et al. discloses the rendering unit resides on an expansion board of the graphics adapter (expansion bus interface; col. 3, lines 41-56); the expansion board comprises a memory (memory 124; col. 3, lines 51-52); the rendering resides on an expansion board that is plugged into the system (col. 3, lines 48-56); the rendering unit resides on a motherboard of the system (col. 12, lines 6-12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate devices taught by Bodin into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because it would provide communication between an application and a device using a device driver (col. 1, lines 9-11).

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7. Claims 93, 94 and 97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perry, U.S. Patent No. 6,483,518, in view of Pfister et al. (6,498,607) and further in view of Mori et al. (6,704,018).

Claim 93, Mori et al. teaches a computer system including a communication device (communication unit 4; col. 6, lines 31-36).

Claim 94, Mori et al. discloses a memory coupled with the bus (DVD driver, hard disk driver connected to the bus; fig. 1); a processor coupled with the bus (CPU , graphic processor coupled to the bus bridge; fig. 1); a communication device coupled with the bus (communication unit 4 coupled to the low speed bus; fig. 1); a rendering unit having logic to render a graphical data (D/A converter; figs. 1, 9-11). The remarks presented above with respect to claim 67 apply equally to the remainder of this claim.

Claim 97, Mori et al. discloses a second rendering unit coupled with the bus to render a spatial patch in parallel with the rendering of the data structure (rendering processors in parallel in figs 18- 20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate taught by Mori into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because it would improve the use efficiency of the processing elements, improve the total processing speed.

Response to Arguments

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8. Applicant's arguments with respect to new claims 67-99 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

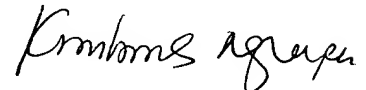
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimbinh T. Nguyen whose telephone number is (571) 272-7644. The examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Friday from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached at (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 1, 2005



KIMBINH T. NGUYEN
PRIMARY EXAMINER